defining a unique binary identification code comprising a plurality of binary bits of sufficient number that each of said transmitter means in said facility transmits a different binary identification code, means responsive to an algorithm for controlling said means for transmitting said infrared pulse bursts during a predetermined time interval, with the occurrence of each pulse burst in time relative to the start of each time interval varying from time interval to time interval, the amount of said varying being controlled by said means responsive to an algorithm incorporated in each transmitter using said unique binary identification code of that transmitter for preventing synchronization with other transmitters and with ambient periodic resident signals in the facility;

receiver means responsive to said pulse bursts by said plurality of transmitter means at each of said diverse sites in said facility for detecting infrared pulse bursts by said transmitter means; and

central means responsive to said receiver means for establishing the location of said transmitter means in said facility.

50. The system of claim 49 wherein said transmitter means includes a microcontroller responsive to said algorithm.

51. The system of claim 49 wherein said means for transmitting pulse bursts includes a microcontroller having memory containing said unique binary identification code.

52. The system of claim 51 wherein said microcontroller includes microcinary identification code, and said checksum.

53. The system of claim 49 wherein said identification code comprises at least 20 binary bits to provide at least 1,048,576 different identification codes.

54. The system of claim 49 wherein each pulse burst is of about 20 milliseconds in duration.

55. The system of claim 49 wherein said pulse bursts each occur once in the predetermined time interval of about one second.

56. The system of claim 49 wherein said receiver means responsive to said pulse bursts includes a microcontroller for executing microcode to establish a valid code burst from received pulse bursts.

57. The system of claim 49 wherein each pulse of said pulse bursts is transmitted by a 10 microsecond flash of infrared light.

58. The system of claim 49 wherein said receiver means responsive to code bursts includes a plurality of discrete receivers each having a reception range about a premises with an allowable overlap with the reception range of another of such receivers; each of said receivers being responsive to said pulse bursts to validate said binary identification code and thereby establish presence of said transmitter means within the reception range of a receiver.

59. The system of claim 58 wherein said central means includes gathering station means for validating outputs from each of said plurality of receivers and forming start and stop events, said start events including the identity of the one receiver of said plurality of receivers, the binary identification code of one transmitter of the said plurality

of the transmitters, and when the pulse bursts of such transmitter was detected by such receiver; said stop event including the identity of the one receiver of said plurality of said receivers, the unique identification code of the said one transmitter when loss of reception has occurred within the reception range, and when such loss of reception occurred.

60. The system of claim 59 wherein said gathering station means includes a plurality of gathering stations connected by a serial port to a central computer which includes a storage medium for storing said start and stop events derived from each of said plurality of gathering stations.

61. The system of claim 60 wherein said central computer includes a plurality of said serial ports, each of said ports being connected to a plurality of gathering stations for receiving said start and stop events.

62. The system of claim 61 wherein said central computer has a interface including a terminal and a keyboard for a user to request and receive the location of any of said transmitter means.

63. The system of claim 62 further including display means responsive to said central computer for assembling reports, and means to input commands to said central computer by an authorized operator to assemble said reports of movements of any of said transmitter means recorded and stored in said storage medium.

64. The system of claim 63 for tracking the movements of hospital personnel and allied hospital equipment, and interfacing to an existing nurse call hospital system by providing: that each of said plurality of said transmitter means comprises a

portable communication badge worn by allied hospital personnel, including nurses, and attached to said hospital equipment; said means for establishing the location including a receiver installed in each patient room to interface with said nurse call hospital system; a receiver installed in each patient room for indicating when said allied hospital personnel wearing one of the said badges enters the room, and the class of a number of classes to which the allied hospital personnel belongs; and an interface between said central computer and said nurse call hospital system such that location queries entered at terminals of said hospital system are routed to said central computer.

65. A stationary receiver installable on the premises of a facility in combination with at least one transmitter means adapted for movement about said facility with a person, with an animal or with equipment to allow monitoring of such transmitter means within any of diverse sites in the facility, said transmitter means including infrared emitter means controlled by controller means for emitting infrared pulses, an algorithm unique to and with that transmitter means for controlling said controller means for producing emissions of infrared pulse bursts by said infrared emitting means for defining a unique binary identification code at diverse times during each of predetermined time intervals, said algorithm controlling said controller means for causing each pulse burst in each successive time interval relative to the start of each of the successive time intervals to occur differently from time interval to time interval, said stationary receiver including means for detecting infrared transmissions of said pulse bursts and means responsive to said means for detecting for producing an electrical signal identifying said transmitter

means.

66. The stationary receiver of claim 65 wherein said pulse bursts include a pulse position scheme to represent at least two binary bits of the identification code with one pulse for reducing the number of pulses required to represent said unique binary identification code.

67. The stationary receiver of claim 65 wherein said pulse bursts include an error detection word with said binary identification code and wherein said means for receiving is responsive to said error detection word to insure integrity of reception of pulse bursts.

68. The stationary receiver of claim 67 wherein said error detection word is transmitted according to a pulse position scheme wherein at least two binary bits of the error detection word are represented with one pulse.

69. The stationary receiver of claim 67 wherein said error detection word is a binary checksum.

70. The stationary receiver of claim 67 further including means for recalculating said error detection word using the received binary identification code and means for comparing such recalculated error detection code with said received error detection code to validate an error free pulse burst reception.

71. The stationary receiver of claim 65 wherein the means of receiving includes a microcontroller for executing microcode to establish a valid code burst from received pulse bursts.

72. A locator system comprising a number of individual portable transmitter units, a number of individual stationary receiver units, and central data processing means;

said transmitter units each comprising infrared transmission means and programmable microprocessor means remotely separated from said central data processing means such that each said receiver unit has the capability to store multiple said unique identity data streams received from multiple said transmitter units and can communicate said identity data streams to said central data processing means.

73. The system of claim 72, where each said unique identity data stream comprises a stream of digitally pulsed infrared radiation consisting of 16 data bits framed by a pair of start bits and a stop bit.

74. The system of claim 72, where each said transmitter unit transmits said identity data stream in a unique non-standard periodic pattern, such that no two said transmitter units transmit with identical periodic patterns.

75. The system of claim 72, where said transmitter units transmit both vertically and horizontally.

76. The system of claim 72, where said transmitter unit microprocessor means is programmed to one of 65,535 possible said unique identity

data streams.

77. The system of claim 72, where said receiver unit microprocessor means test each received said identity data stream for validity.

78. The system of claim 72, further comprising a number of slave receiver units connected to individual said receiver units, said slave units comprising infrared receiving means and means to communicate received said identity data streams from said transmitter units to said receiver units, said slave receiver unit having no individual microprocessor means.

79. The system of claim 72 where each said transmitter unit repeatedly transmits said identity data stream in a unique non-standard periodic pattern consisting of three transmissions with different time intervals between each of said three transmission in said pattern, and where no two said transmitter units have identical time intervals between said three transmissions.

80. The system of claim 72, where each said transmitter unit repeatedly transmits said identity data stream once during successive predetermined time periods, with the time interval between each two successive transmissions differing from the time interval between the previous two successive transmissions.

81. The system of claim 72 where at least one said individual remote receiver unit is in communication with one or more slave receiver units, said slave

receiver units having no individual microprocessor means and comprising infrared receiving means to receive said identity data streams from said transmitter units and means to communicate received said identity data streams to said at least one said individual remote receiver unit.

32. A locator system comprising a number of individual portable transmitter units, a number of stationary individual remote receiver units, and a central data processing means;

said transmitter units each comprising infrared transmission means and programmable microprocessor means such that a unique identity data stream is transmitted by each transmitter unit;

said individual remote receiver units each comprising a single infrared receiving means and a single programmable microprocessor means, such that the total number of said programmable microprocessor means is equal to the total number of said individual remote receiver units in said locator system, such that each said individual remote receiver unit has the capability to store multiple said unique identity data streams received from multiple said transmitter units and can communicate said identity data streams to said central data processing means.

33. The system of claim 32, where said unique identity data stream comprises a stream of digitally pulsed infrared radiation consisting of 16 data bits

framed by a pair of start bits and a stop bit.

84. The system of claim 82, where each said transmitter unit transmits said identity data stream in a unique non-standard periodic pattern, such that no two said transmitter units transmit with identical periodic patterns.

85. The system of claim 82, where said transmitter units transmit both vertically and horizontally.

86. The system of claim 82, where said transmitter unit microprocessor means is programmed to one of 65,535 possible said unique identity data streams.

87. The system of claim 82, where said receiver unit microprocessor means test each received said identity data stream for validity.

88. The system of claim 82, further comprising a number of slave receiver units connected to individual said receiver units, said salve units comprising infrared receiving means and means to communicate received said identity data streams from said transmitter units to said receiver units, said slave receiver units having no individual microprocessor means.

89. The system of claim 82, where each said transmitter unit repeatedly transmits said identity data stream in a unique non-standard periodic pattern consisting of three transmissions with different time intervals between each

of said three transmissions in said pattern, and where no two said transmitter units have identical time intervals between said three transmissions.

90. The system of claim 82, where each said transmitter unit repeatedly transmits said identity data stream once during successive predetermined time periods, with the time interval between each two successive transmissions differing from the time interval between the previous two successive transmissions.

91. The system of claim 82, where at least one said individual remote receiver unit is in communication with one or more slave receiver units, said slave receiver units having no individual microprocessor means and comprising infrared receiving means to receive said identity data streams from said transmitter units and means to communicate received said identity data streams to said at least one said individual remote receiver unit.

92. A locator system comprising a number of individual portable transmitter units, a number of stationary individual remote receiver units, and a central data processing means;

said transmitter units each comprising infrared transmission means and programmable microprocessor means such that a unique identity data stream is transmitted by each transmitter unit;

said individual remote receiver units each comprising a paired single

infrared receiving means and single programmable microprocessor means, said single programmable microprocessor means being in communication with only one said individual remote receiver unit, such that each said individual remote receiver unit has the capability to store multiple said unique identity data streams received from multiple said transmitter units and can communicate said identity data streams to said central data processing means.

41 40
~~93~~. The system of claim ~~92~~, where said unique identity data stream comprises a stream of digitally pulsed infrared radiation consisting of 16 data bits framed by a pair of start bits and a stop bit.

42 40
~~94~~. The system of claim ~~92~~, where each said transmitter unit transmits said identity data stream in a unique non-standard periodic pattern, such that no two said transmitter units transmit with identical periodic patterns.

43 40
~~95~~. The system of claim ~~92~~, where said transmitter units transmit both vertically and horizontally.

44 40
~~96~~. The system of claim ~~92~~, where said transmitter unit microprocessor means is programmed to one of 65,535 possible said unique identity data streams.

45 40
~~97~~. The system of claim ~~92~~, where said receiver unit microprocessor means test each received said identity data stream for validity.

98. The system of claim 92, further comprising a number of salve receiver units connected to individual said receiver units, said slave units comprising infrared receiving means and means to communicate received said identity data streams from said transmitter units to said receiver units, said slave receiver units having no individual microprocessor means.

99. The system of claim 92, where each said transmitter unit repeatedly transmits said identity data stream in a unique non-standard periodic pattern consisting of three transmissions with different time intervals between each of said three transmissions in said pattern, and where no two said transmitter units have identical time intervals between said three transmissions.

100. The system of claim 92, where each said transmitter unit repeatedly transmits said identity data stream once during successive predetermined time periods, with the time interval between each two successive transmissions differing from the time interval between the previous two successive transmissions.

101. The system of claim 92, where at least one said individual remote receiver unit is in communication with one or more slave receiver units, said slave receiver units having no individual microprocessor means and comprising infrared